



# UPDATE on HCAL ELECTRONICS SIMULATION



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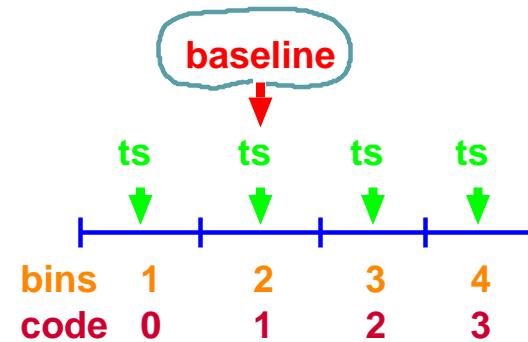
- **Calculational details**
- **Noise-induced HcalTrigPrim occupancy**
- **Single pions as L1, L2 jets**
- **Noise-induced off-line EcalPlusHcalTower occupancy**

## ■ OLD

- noise = 0.0006 GeV (effectively means 43, 88 and 142 MeV in HB)
- no photostatistics effect
- no QIE integration (but amplitude measurement "a la" ECAL)
- no ADC quantization
- conjugated signal-noise evaluation using 8 time buckets

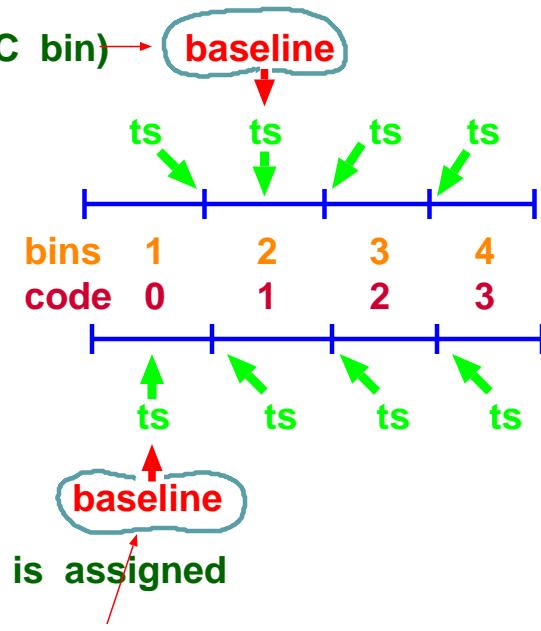
## ■ NEW

- noise = 2 pe = 200 MeV (since 10 pe / GeV)
- photostatistics
- QIE integration : df -> ts - the middle of the bin is assigned
- ADC quantization : LSB = 3 pe, baseline = 0 pe (2nd ADC bin)
- TrigPrim weights = -1.5, -1.5, -1, 1, 1 (5)
- RecHit weights = -2, -2, 1, 1, 1, 1 (6)



## ■ NEW ++

- noise = 2 pe = 200 MeV (since 10 pe / GeV)
- photostatistics
- QIE integration : df  $\rightarrow$  ts - the edge closest to baseline is assigned
- ADC quantization : LSB = 3 pe, baseline = 0 pe (2nd ADC bin) → **baseline**
- TrigPrim weights = -1, -1, -1, 1, 1, 1 (6)
- RecHit weights = -1, -1, -1, 1, 1, 1, 1, -1 (8)

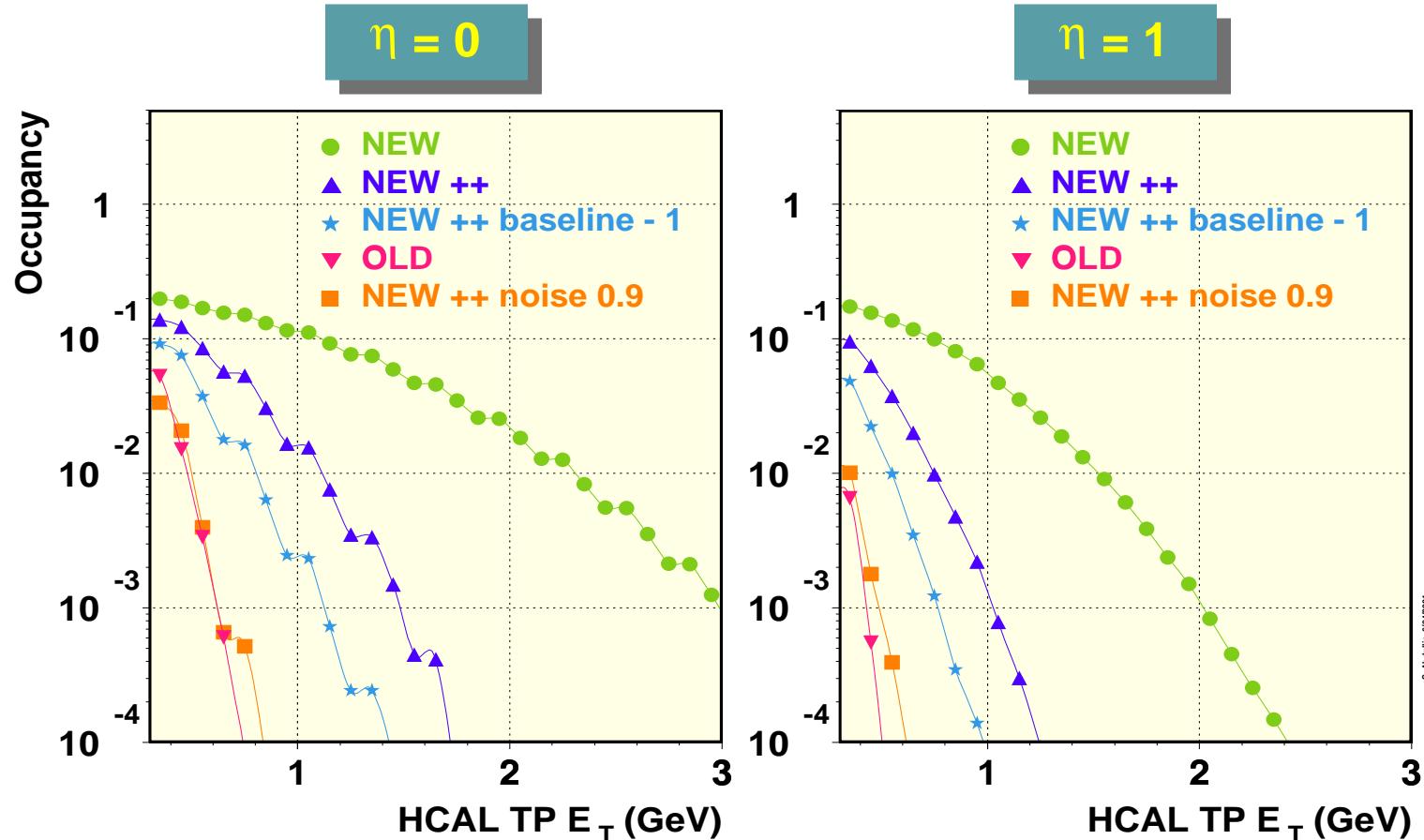


## ■ NEW ++ baseline - 1

- noise = 2 pe = 200 MeV (since 10 pe / GeV)
- photostatistics
- QIE integration : df  $\rightarrow$  ts - the edge closest to baseline is assigned
- ADC quantization : LSB = 3 pe, **baseline = -3 pe (1st ADC bin)**
- TrigPrim weights = -1, -1, -1, 1, 1, 1 (6)
- RecHit weights = -1, -1, -1, 1, 1, 1, 1, -1 (8)



# HCAL TRIGGER PRIMITIVE "OCCUPANCY" due to NOISE



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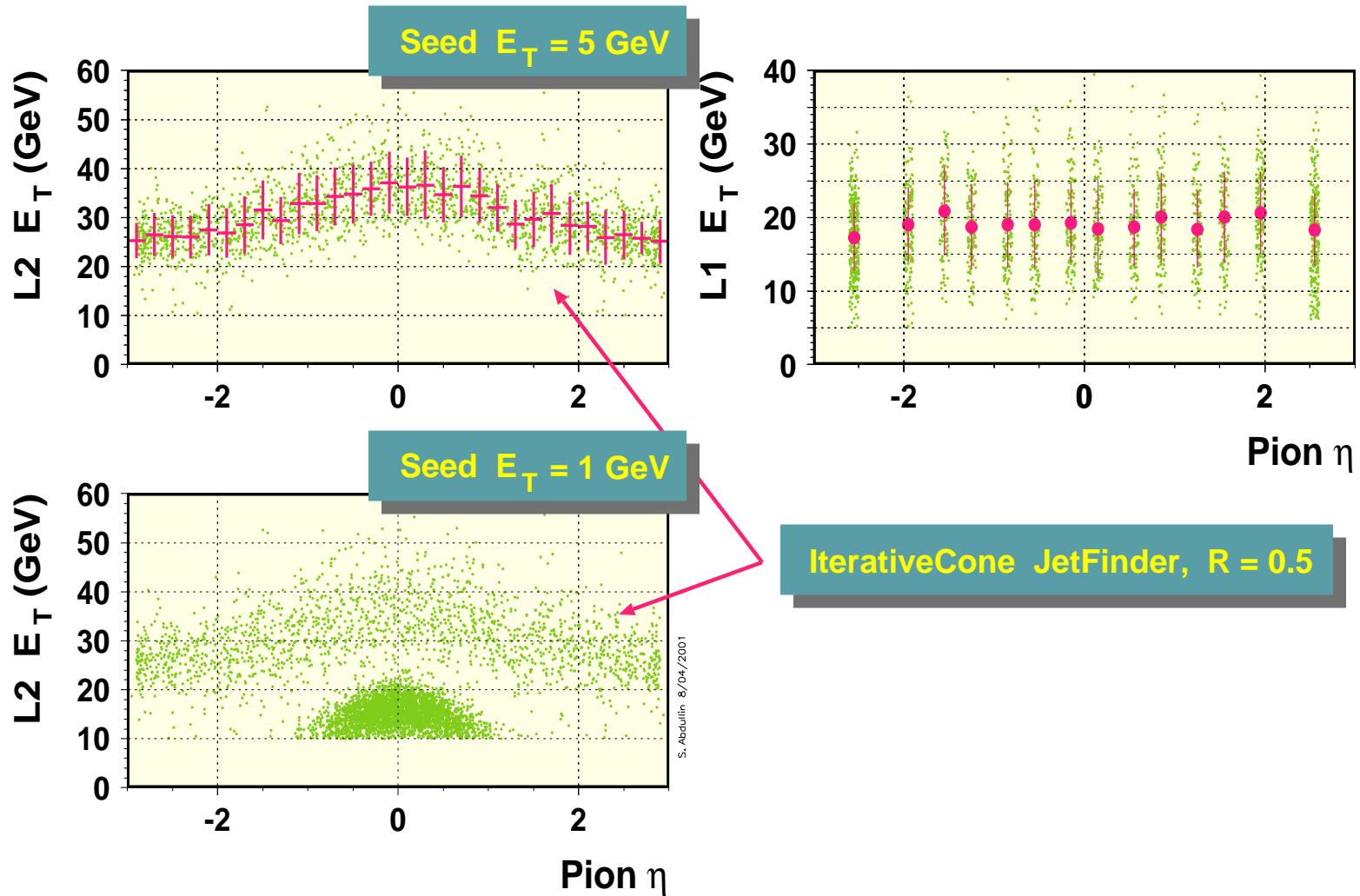
- **NEW :** weights = -1.5, -1.5, 1, 1, 1, df -> ts : the middle of the bin
- **NEW ++ :** weights = -1, -1, -1, 1, 1, 1, df -> ts : the closest to the baseline
- **NEW ++ baseline - 1 :**  
weights = -1, -1, -1, 1, 1, 1, ADC baseline in the 1st channel instead 2d



# *L1, L2 JETS from SINGLE PIONS (I)*



■ NEW ++ baseline -1 (the best so far)

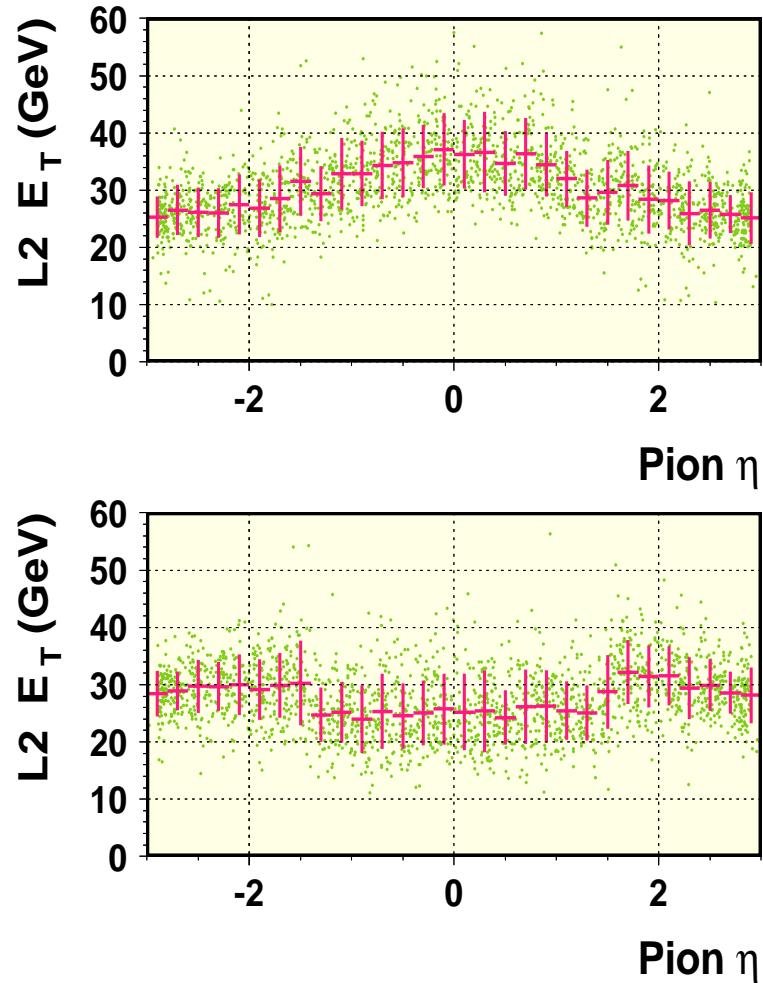




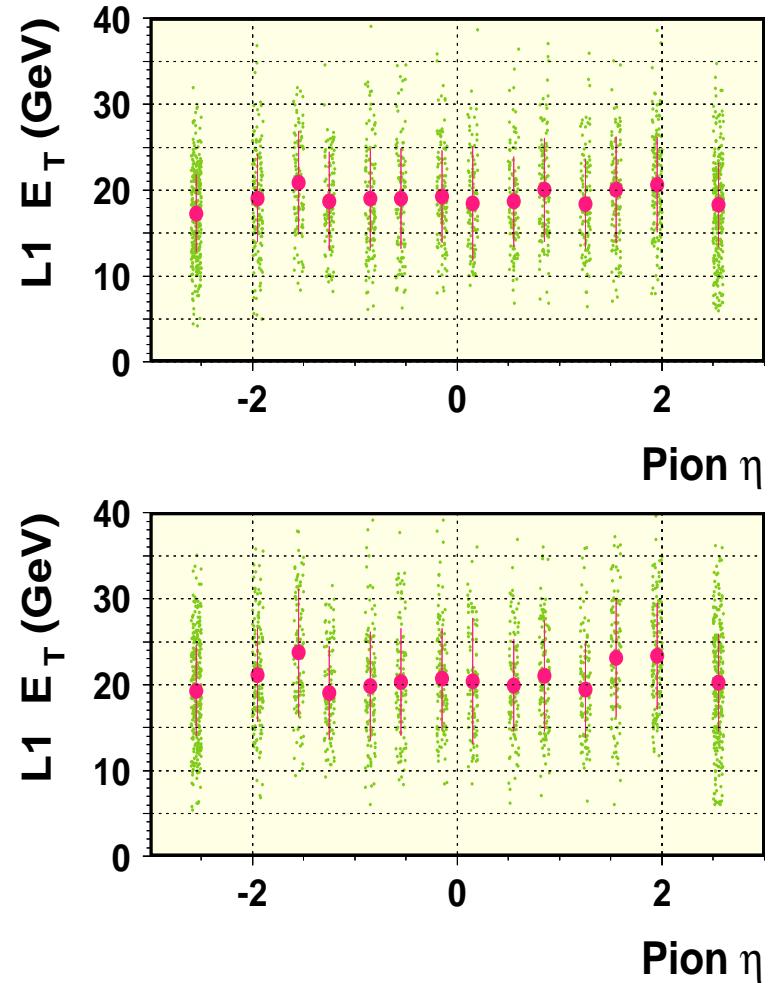
# *L1, L2 JETS from SINGLE PIONS (II)*



**NEW**



**OLD**



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# CALO TOWER "OCCUPANCY" due to NOISE



- NEW : RecHit reconstruction weights = -1, -1, -1, 1, 1, 1, 1, -1

